

CLAIMS

1. An image decoding apparatus comprising:
an analyzing section which determines a
process quantity of a coded image data to each of a
5 plurality of image decoding processes within a unit
process time based on a parameter for said coded image
data, prior to said plurality of image decoding
processes; and
an image decoding section which carries out
10 each of said plurality of image decoding processes to
said coded image data for the determined process
quantity such that a decoded image data is generated
from said coded image data.
- 15 2. The image decoding apparatus according to
claim 1, wherein said parameter is an internal
parameter of said coded image data.
3. The image decoding apparatus according to
20 claim 1, wherein said parameter is an external
parameter for said coded image data.
4. The image decoding apparatus according to
claim 1, wherein said parameter contains an internal
25 parameter of said coded image data, and an external
parameter for said coded image data.

5. The image decoding apparatus according to any of claims 1 to 4, wherein said coded image data comprises a plurality of code blocks, and
said analyzing section determines said
5 process quantity to each of said plurality of image decoding processes by determining a code block process quantity for each of said plurality of code blocks based on said unit process time.
- 10 6. The image decoding apparatus according to any of claims 1 to 5, wherein said coded image data is a part of a coded image data stream,
a stream process time of said coded image data stream is previously determined, and
15 said unit process time is determined based on a number of said coded image data in said coded image data stream and said stream process time.
7. The image decoding apparatus according to
20 claim 6, wherein said plurality of decoding processes contains an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process, and
said image decoding section carries out a set
25 of said arithmetic decoding process and said bit modeling decoding process, said inverse quantization process, and said inverse wavelet conversion process

in a pipeline.

8. The image decoding apparatus according to claim 7, wherein said image decoding section
5 comprises:

an arithmetic decoding section which carries out said arithmetic decoding process to said coded image data for the determined process quantity;

a bit modeling decoding section which carries
10 out said bit modeling decoding process to a result of said arithmetic decoding process by said arithmetic decoding section in a form of bit planes every color component for the determined process quantity;

an inverse quantization section which carries
15 out said inverse quantization process to a result of said bit modeling decoding process by said bit modeling decoding section for the determined process quantity; and

an inverse wavelet conversion process section
20 which carries out said inverse wavelet conversion process to a result of said inverse quantization process by said inverse quantization section for the determined process quantity.

25 9. The image decoding apparatus according to any of claims 1 to 4, wherein said coded image data is encoded into a plurality of layers,

said analyzing section determines a number of layers to be decoded based on said process quantity of said coded image data in said inverse quantization process and said process quantity of said coded image data in said inverse wavelet conversion process, and

said image decoding section carries out each of said plurality of decoding processes to said coded image data for the determined number of layers to be decoded.

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10. The image decoding apparatus according to claim 9, wherein said analyzing section discards a part of said coded image data other than a part of said coded image data associating with the determined number of layers to be decoded.

11. The image decoding apparatus according to claim 9 or 10, wherein said plurality of decoding processes contain an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process,

each of said plurality of layers of said coded image data contains a plurality of code blocks, said parameter contains a weight coefficient allocated to each of said plurality of code blocks,

said analyzing section determines a number of coding paths in said arithmetic decoding process and

said bit modeling decoding process to each of said plurality of code blocks from said weight coefficients and said unit process time, and determines a number of bit planes from the determined coding paths, and

5 said image decoding section carries out said inverse quantization process and said inverse wavelet conversion process to said coded image data for the determined number of bit planes.

10 12. An image decoding method of decoding a decoded image data from a coded image data through a plurality of decoding processes, comprising:

 determining a process quantity of said coded image data in each of said plurality of image decoding processes within a unit process time based on a
15 parameter for said coded image data; and

 carrying out said plurality of image decoding processes to said coded image data for the determined process quantities.

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13. The image decoding method according to claim 12, wherein said parameter is an internal parameter of said coded image data.

25 14. The image decoding method according to claim 12, wherein said parameter is an external parameter for said coded image data.

15. The image decoding method according to claim 12, wherein said parameter contains an internal parameter of said coded image data, and an external parameter for said coded image data.

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16. The image decoding method according to any of claims 12 to 15, wherein said coded image data contains a plurality of code blocks,

said determining a process quantity

10 comprises:

determining said process quantity by determining a code block process quantity allocated to each of said plurality of code blocks based on said unit process time.

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17. The image decoding method according to any of claims 12 to 16, wherein said coded image data is a part of a coded image data stream,

a stream process time of said coded image

20 data stream is predetermined, and

said image decoding method further comprises:

determining said unit process time based on a number of said coded image data in said coded image data stream and said stream process time.

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18. The image decoding method according to claim 17, wherein said plurality of decoding processes

contain an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process,

said carrying out said plurality of image
5 decoding processes comprises:

carrying out a set of said arithmetic decoding process and said bit modeling decoding process, said inverse quantization process, and said inverse wavelet conversion process in a pipeline.

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19. The image decoding method according to any of claims 12 to 15, wherein said carrying out said plurality of image decoding processes comprises:

carrying out said arithmetic decoding process
15 to said coded image data for the determined process quantity;

carrying out said bit modeling decoding process to a result of said arithmetic decoding process for the determined process quantity;

20 carrying out said inverse quantization process to a result of said bit modeling decoding process for the determined process quantity; and

carrying out said inverse wavelet conversion process to a result of said inverse quantization
25 process for the determined process quantity.

20. The image decoding method according to any of

claims 12 to 15, wherein said coded image data is encoded in a plurality of layers,

said determining a process quantity comprises:

5 determining a number of layers to be decoded based on said process quantities of said coded image data in said inverse quantization process and said process quantity of said coded image data in said inverse wavelet conversion process, and

10 said carrying out said plurality of image decoding processes comprises:

 carrying out each of said plurality of decoding processes to said coded image data for the determined number of layers to be decoded.

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21. The image decoding method according to claim 20, further comprising:

 discarding a part of said coded image data other than a part of said coded image data
20 corresponding to the determined number of layers to be decoded.

22. The image decoding method according to claim 20 or 21, wherein said plurality of decoding processes
25 contain an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process,

each of said plurality of layers of said
coded image data contains a plurality of code blocks,
said parameter contains a weight coefficient
allocated to each of said plurality of code blocks,
5 said determining a process quantity
comprises:

determining a number of coding paths in said
arithmetic decoding process and said bit modeling
decoding process to each of said plurality of code
10 blocks from said weight coefficients and said unit
process time; and

determining a number of bit planes from the
determined coding paths, and

said carrying out said plurality of image
15 decoding processes comprises:

carrying out said inverse quantization
process and said inverse wavelet conversion process to
said coded image data for the determined number of bit
planes.

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23. A computer-readable recording medium on which
a software is recorded to realize said image decoding
method according to any of claims 12 to 22.